

Amendment and Response

Applicant: Jeff Davis et al.

Serial No.: 09/931,987

Filed: August 17, 2001

Docket No.: 10010715-1

Title: ONE CHIP USB OPTICAL MOUSE SENSOR SOLUTION

REMARKS

This Amendment is responsive to the Office Action mailed September 25, 2003. In that Office Action, the Examiner rejected claims 1-5, 8-13, 15-19, 21, and 22 under 35 U.S.C. §103(a) as being unpatentable over Williams et al., U.S. Patent No. 4,751,505 ("Williams") in view of Piot et al., U.S. Patent No. 6,256,016 ("Piot"). Claims 6, 7, 14, and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Williams in view of Piot, and further in view of Siddiqui, U.S. Patent No. 5,912,661 ("Siddiqui").

With this Response, the Applicant respectfully traverses the Examiner's rejection of claims 1-22. Claims 1-22 remain pending in the application and are presented for reconsideration and allowance.

35 U.S.C. §103 Rejections

The Examiner rejected claims 1-5, 8-13, 15-19, 21, and 22 under 35 U.S.C. §103(a) as being unpatentable over Williams et al., U.S. Patent No. 4,751,505 ("Williams") in view of Piot et al., U.S. Patent No. 6,256,016 ("Piot").

Claim 1 includes the limitation "a single chip for receiving the reflected images, generating digital representations of the reflected images, generating a first set of movement data based on the digital representations of the reflected images, the first set of movement data indicative of relative motion between the chip and the imaging surface, the single chip including a serial interface for outputting motion data in a serial format based on the movement data." The Examiner stated that "[t]he only thing Williams does not show is a serial interface included in the single chip." (Office Action at para. no. 4, page 3). The Examiner also stated that:

In the same field of endeavor, Pito teaches that the microcontroller (650) is also coupled to the line interface 660 . . . the output from the line interface (650) is a standard communication, such as a serial port communication protocol; see column 13, lines 41-54. Pito also teaches that microcontroller (650) can be integrated by different modules such 620, 625 (see column 13, lines 45-54). Thus it would have been obvious that the microcontroller (650) can be integrated with the serial interface protocol (660) so as to reduce the size of the input device. Therefore, it would have been obvious to one of ordinary skill in the art at the invention was made to have added a serial interface as taught by Piot to the integrated circuit of Williams so that the size of the input device can be reduced. (Office Action at para. no. 4, page 3).

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The Federal Circuit has stated, “[i]n holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention.” *Karsten Manufacturing Corp. v. Cleveland Golf Co.*, 58 U.S.P.Q.2d 1286, 1293 (CAFC 2001). There is no suggestion in Williams or Piot to combine the cited references in any way, let alone in a way that would produce the claimed invention. Williams and Piot disclose different types of devices that rely on different processing techniques. The optical mouse disclosed in Williams requires that it be used in conjunction with a special patterned mouse pad. (See, e.g., Williams at col. 2, lines 3-5; and col. 2, lines 59-61). In contrast, the optical detection system disclosed in Piot generates speckle images from a scattered collimated beam, and Piot indicates that “[t]he system works with any surface that can diffusely scatter a collimated beam.” (See, e.g., Piot at Abstract).

Furthermore, Williams includes no teaching or suggestion that the optical mouse disclosed therein could or should be modified to include a serial interface anywhere within the mouse, let alone that a serial interface could or should be incorporated into the integrated circuit 124. Piot includes no teaching or suggestion that the line interface 660 could or should be incorporated into the same integrated circuit as microcontroller 650 and/or other circuitry, such as the photosensor arrays 320, or cross-correlation modules 620 and 625. Rather, Piot discloses that: “It is noted that the photosensor arrays 320, microcontroller 650, and cross-correlation modules 620, 625 may be integrated on a single complementary metal oxide semiconductor integrated circuit using a conventional digital signal processing (“DSP”) core. In an alternative embodiment, these elements may be built using discrete integrated circuits such as a microcontroller or DSP chips, for example.” (Piot at Col. 13, lines 46-53). Piot includes no teaching or suggestion that the line interface 660 might also be incorporated into this single CMOS integrated circuit. Even if Williams and Piot were combined, which there is no suggestion to do, and the line interface 660 of Piot were incorporated into the optical mouse disclosed in Williams, as suggested by the Examiner, the teachings of Piot indicate that the line interface 660 would not be incorporated into a common integrated

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circuit with other elements of the mouse. Thus, the combination of Williams and Piot does not teach or suggest each and every limitation of claim 1.

In view of the above, independent claim 1 is not taught or suggested by Williams and Piot, either alone, or in combination. In addition, dependent claims 2-5, 8, and 9, which further limit patentably distinct claim 1, are also believed to be allowable over the cited references. The Applicant respectfully traverses the rejection of claims 1-5, 8, and 9, and allowance of claims 1-5, 8, and 9 is respectfully requested.

Claim 10 includes the limitation "outputting movement data in a serial format from the electronic chip based on the generated motion data". The Examiner stated that "[a]s to claim 10, this claim differs from claim 1 in that claim 1 is apparatus whereas claim 10 is method. Thus, method claim 10 is met by Williams in view of Piot." (Office Action at para. no. 4, page 3). As described above with respect to claim 1, there is no suggestion in the cited references to combine Williams and Piot, and even if the references are combined, they do not teach or suggest the limitations of claim 1. For the reasons set forth above with respect to claim 1, the combination of Williams and Piot also does not teach or suggest the limitations of claim 10, including the limitation "outputting movement data in a serial format from the electronic chip based on the generated motion data".

In view of the above, independent claim 10 is not taught or suggested by Williams and Piot, either alone, or in combination. In addition, dependent claims 11-13, and 15, which further limit patentably distinct claim 10, are also believed to be allowable over the cited references. The Applicant respectfully traverses the rejection of claims 10-13, and 15, and allowance of claims 10-13, and 15 is respectfully requested.

Claim 16 is directed to an electronic chip that includes "a serial interface coupled to the controller for outputting motion data based on the generated movement data in a serial format." The Examiner stated that "[a]s to claim 16, this claim differs from claim 1 in that the limitation an analog to digital converter is additional recited." (Office Action at para. no. 4, page 4). As described above with respect to claim 1, there is no suggestion in the cited references to combine Williams and Piot, and even if the references are combined, they do not teach or suggest the limitations of claim 1. For the reasons set forth above with respect to claim 1, the combination of Williams and Piot also does not teach or suggest the limitations

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of claim 16, including the limitation "a serial interface coupled to the controller for outputting motion data based on the generated movement data in a serial format."

In view of the above, independent claim 16 is not taught or suggested by Williams and Piot, either alone, or in combination. In addition, dependent claims 17-19, 21, and 22, which further limit patentably distinct claim 16, are also believed to be allowable over the cited references. The Applicant respectfully traverses the rejection of claims 16-19, 21, and 22, and allowance of claims 16-19, 21, and 22 is respectfully requested.

The Examiner rejected Claims 6, 7, 14, and 20 under 35 U.S.C. §103(a) as being unpatentable over Williams in view of Piot, and further in view of Siddiqui, U.S. Patent No. 5,912,661 ("Siddiqui"). Claims 6, 7, 14, and 20 are dependent on independent claim 1, 10, or 16. As described above, Williams and Piot do not teach or suggest the above-quoted limitations of claims 1, 10, and 16. Siddiqui also does not teach or suggest the above-quoted limitations of claim 1, 10, and 16. In view of the above, dependent claims 6, 7, 14, and 20, which further limit patentably distinct claim 1, 10, or 16, are believed to be allowable over the cited references, either alone, or in combination. The Applicant respectfully traverses the rejection of claims 6, 7, 14, and 20, and allowance of claims 6, 7, 14, and 20 is respectfully requested.

Allowable Subject Matter

In light of the above, Applicant believes independent claims 1, 10, and 16, and the claims depending therefrom, are in condition for allowance. Allowance of these claims is respectfully requested.

CONCLUSION

Any inquiry regarding this Amendment and Response should be directed to Jeff A. Holmen at the below-listed telephone number or Pamela Lau Kee at Telephone No. (408) 553-3059, Facsimile No. (408) 553-3063. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 12th day of November, 2003.

By Jeff A. Holmen
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